Memoirs from an IPv6 deployment in the hosting network

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LeaseWeb, established in **1997**, is now one of the biggest hosting companies with multiple datacenters in **EU** and **US**.

- **70.000.000 €** revenue
- **40.000** servers
- **>10.000** customers
- **1.250.000.000.000 bps** traffic
- **200** employees

OCOM group:

LeaseWeb – hosting

EvoSwitch – running datacenters

FiberRing – ISP, data transmission

DataXenter – building modular datacenters

History of IPv6 at LeaseWeb

- **2004** – IPv6 /32 range received, all routers bought later on considering v6 support
- **2004-2006** – initial v6 transits and peerings
- **2008** – a server provided for SixXS, real work started on v6 deployment
- **2009** – IPv6 addressing plan ready, tests
- **2010** – full deployment

Assumptions we made:

- IPv6 as similar to IPv4 as possible, gateways as public addresses from within the assigned range, not link-local, RA completely disabled
- Customers in shared racks using shared IPv4 subnets get **65536** IPv6 addresses (**/112**) out of shared v6 range
- Customers with dedicated racks get **/64** up to **/48**, mostly with some granulation, to allow them further expansion

The deployment:

- The addressing plan done and approved
- Expanded v6 peerings and transits
- Before the launch we had just a few IPv6 customers and barely any requests for it
- Testing different setups and finding our own best practices
- Started improving internal tools and systems
- Announcements to customers

Current IPv6 situation:

- About **400** customers with IPv6 assignments (out of >10.000, so less than **5%**)
- More than half of IPv6 assigned customers using v6 for production traffic
- **1** customer with **1** IPv6-only server
- **700** SixXS tunnels with **250** routed subnets, in total generating up to **120** Mbps traffic
- Total IPv6 traffic estimated to be between **500Mbps** and **1Gbps** (out of 1.25Tbps)

```
server: host www.leaseweb.com
www.leaseweb.com has address 85.17.134.129
www.leaseweb.com has IPv6 address 2001:1af8:4300:4:2600:0:42:1

server: host -t mx leaseweb.com
leaseweb.com mail is handled by 10 mailfilter1.ocom.com.
leaseweb.com mail is handled by 10 mailfilter2.ocom.com.
mailfilter1.ocom.com has address 85.17.96.76
mailfilter1.ocom.com has IPv6 address 2001:1af8:2100:1::20
mailfilter2.ocom.com has address 85.17.150.116
mailfilter2.ocom.com has IPv6 address 2001:1af8:4300:1::20

server: dig leaseweb.com ns
leaseweb.com.           207     IN      NS      ns4.leaseweb.net.
leaseweb.com.           207     IN      NS      ns1.leaseweb.nl.
leaseweb.com.           207     IN      NS      ns5.leaseweb.nl.
ns1.leaseweb.nl.        219     IN      A       62.212.64.121
ns4.leaseweb.net.       2928    IN      A       62.212.78.199
ns5.leaseweb.nl.        219     IN      A       83.149.64.123
```

How do we promote IPv6 among customers:

- All new customers informed about possibility of IPv6 assignments, v6 addresses not assigned by default though
- Administrative fee for IPv4 addresses, IPv6 are free of charge
- Special IPv4 justification form asks: „*Have you considered using IPv6 for at least part of your services?*”
- Twitter, Facebook, blog

Overestimated issues:

- Quality problems with IPv6 in open Internet, difficulties troubleshooting
- Lack of support or even blocking v6 traffic with so much variety of network hardware/software
- Staff, understanding of the new protocol

Underestimated or nonexpected problems:

- Juniper switches EX 2200 and 3200 have by default igmp snooping enabled on all vlans which blocks any IPv6 traffic
- Difficulties updating internal software, too many IPv4 dependencies
- HSRP/VRRP public IPv6 address on Cisco
- Devices that are best suited for IPv6: switches, APC's, OOB (iLO, DRAC) often still require IPv4 address

Our plans:

- Better IPv6 support in internal systems, more automation
- Top customers still don’t really use IPv6, more promotion and awareness needed
- Assigning IPv6 by default to all customers
- Switches and other network devices on IPv6 only (if only possible)
- Even more IPv6 peerings
- All LeaseWeb websites and servers with IPv6

Summary:

- Hosting is believed to have relative ease with IPv6 support but it is not always the case
- Despite IPv4 being already depleted still vast majority of customers doesn’t want IPv6
- Sometimes things you were really afraid of are not that bad eventually, also people can really quickly learn and addapt to IPv6
- Unexpected problems happen though

Thank you very much, and happy IPv6!